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# The impact of institutions, ownership structure, business angels, venture capital and lead managers on IPO firm underpricing across North Africa

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**Abstract**

Keywords:  IPO; Private Equity; Business Angels; North Africa; Agency Theory

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# 1. Introduction

The often considerable wealth transfer from entrepreneurs and corporate insiders to minority outside investors participating in the firm for first time in its initial primary offering (IPO) debut through substantially deflated issue prices in relation to the true market value of stock has been the subject of a considerable literature (see Smart and Zutter (2003) for detailed review). However the overwhelming majority of this literature is focussed on uncovering the underlying agency-based motivations of insiders for initiating IPO underpricing of stock and the signals selectively available to IPO firms that influence relative levels of underpricing within a single country context. These single country studies are overwhelmingly dominated by those focussed on large developed US IPO market (e.g. Smart and Zutter, 2003 and Arthurs et al, 2008) alongside other developed markets such as UK (Brennan and Franks, 1997) and more recently UK and France (Bruton et al, 2010) and Germany (Tykova and Walz, 2007). It is only more recently that a cross country comparative literature has started to emerge seeking to elaborate on the institutional and corporate governance (at legislative level) differences that impact on often considerable variations in IPO underpricing in worldwide equity markets (see Boulton et al, 2010). However a shortfall in this emerging latter cross-country comparative literature is the almost exclusive focus on the impact of high level institutional differences pervasive across countries with the wholesale omission from consideration of important market participants, such as lead managers and private equity entities. Their presence in particular acts to mitigate asymmetric information surrounding the transformation of the firm from private to public realm during the IPO process. My first contribution to literature is in addressing this shortfall in studying the impact of both lead managers and private equity entities alongside differences in national institutional quality on IPO underpricing.

North Africa forms the distinctive geographic focus of this study due to the proximity to Europe and the distinctive nature of the region's economy with this being made up from extensive interlinked networks of firms that are constituent to one, or often several overlapping, business groups controlled by large extended families. The region's IPO markets have also been largely omitted from study in the literature with the exception of the inclusion of Egypt in a wider 49 country dataset of La Porta et al (1997) and Hearn (2011, 2013). The former La Porta study focuses on country-level institutions while the latter two studies by Hearn focus on the role and impact of extended family networks firstly on IPO firm underpricing and secondly on aggregate board salary, an agency-based incentive measure. The region is also subject to an incongruous mix of French civil code law formal institutions, themselves shaped largely on original unreformed Napoleonic framework since their adoption during colonial rule, and deeper informal institutions making up the fabric of Maghreb society, based on classical Islamic shari'ya law (Hearn, 2011; Kuran, 2004). This incongruity alongside a pronounced role of state in development, eschewed through the Dirigiste

2

tradition in Francophone countries and socialism in Egypt, has been attributed to economic and social structural rigidities that gave rise to the recent unprecedented period of political and social upheaval, popularly termed as the Arab Spring (BBC news, 2011). Consequently there is considerable national policy-level emphasis on economic rejuvenation across the region with added importance attached to both the role of entrepreneurs and growth firms as well as their ability to access finance through capital markets and private equity entities. As such it is timely to undertake a study on this region's primary equity markets and the determinants of IPO underpricing.

The role of early-stage private equity financiers as well as essential market participants to IPO offers such as underwriters in determining levels of underpricing has received considerable attention in the literature. Private equity finance is well recognized in being strategically placed to provide capital to firms subject to extremely high asymmetric information, such as those with minimal track records at start-up (see Berger and Udell, 1998 for an extensive literature review). A key differentiating feature of private equity as opposed to investors simply seeking to derive benefits from diversification of risks associated with personal portfolios is in the level of active management and participation undertaken within portfolio investee firms (Barry et al, 1990). As such private equity financiers are best placed to provide superior monitoring and surveillance of investee firms and their management and thus have superior access to information otherwise either unavailable or prohibitively costly to obtain for more widely dispersed outsider investors. However while the certification of value (signalling theory) of private equity entities is well documented in the literature (see Barry et al (1990) and Bruton et al (2010)) there is conjecture as to the impact of this on IPO underpricing. In recognition of the superior monitoring role played by venture capitalists (VC), Barry et al (1990) argues that VC involvement in a firm leads to their maintaining a larger equity stake following the IPO with less underpricing than comparable non-VC backed firms. In this way VC-backing certifies the intrinsic value of the firm to the market and reduces uncertainty (asymmetric information) reflected in the necessity for larger IPO discounts to attract minority investors (Leland and Pyle, 1977). This certification view is also supported by Megginson and Weiss (1991) and Gompers (1996). However a contrasting view of the impact of VC-backing on IPO firm underpricing is largely derived from deeper arguments regarding the role of VC entities and their interaction with other participants critical to the success of the IPO such as underwriters (Loughran and Ritter, 2004). In this light Hoberg and Seyhun (2006) argue that VC managers and underwriters are repeat collaborators in a "business game" where the former accept elevated levels of underpricing knowing these will be of benefit to the latter. Underwriters assist with marketing support for the new lines of stock, attraction of favourable analyst coverage following IPO event which thus enable IPO firm executives and VC managers to sell their shareholdings later at a higher price. However a common drawback across the literature is the consideration of private equity and in particular, VC, as

a singular entity. Recently Tykova and Walz (2007) drew distinctions between different classes of VC in terms of their being public(state)-backed, independent private sector entities or with prestigious reputation in terms of their impact on underpricing in German IPOs. However these distinctions fail to take into account the breadth of the private equity market and in particular the presence of informal business angel investors (see Mason and Harrison (2002); Webb et al (2012) and Maxwell et al (2011)) as well as the distinction between domestic as opposed to foreign VC activity. As such the study of the differential impact of business angels, domestic and foreign VC on IPO firm underpricing forms my second contribution to literature.

A key assumption behind the certification role of VC managers is that of the potential loss of reputational capital motivating them to signal the true value of the firm to outside investors at IPO. Reputation is essential for VC managers both in order to secure future order flow in the form of the attraction of more entrepreneurs but also in terms of the valuable relationships they build with underwriters, which would be forfeited if certification was false (Megginson and Weiss, 1991). Reputation is deemed key in both the VC manager attracting equally high quality underwriters with whom to work on achieving a successful IPO and vice-versa with reputable underwriters selecting the best VC firms (Megginson and Weiss, 1991). However in Francophone capital markets, including those of North Africa, underwriters as market participants are less common, while the role of lead manager is enhanced, albeit with this being termed as Chef de File (Hearn, 2011). The smaller size of equity markets across the Maghreb region together with relatively infrequent IPO activity infers that the measures of reputation employed for underwriters in very large and active US market (see Megginson and Weiss (1991) and Carter and Manaster (1990)) are only marginally effective. Consequently I develop a new measure of reputation, which is applied to Chef de File or lead managers, which is based on a simple aggregation of reputation based on IPO gross proceeds as well as the proportion of total IPOs with which the lead manager has been involved. While this is an extension of that of Megginson and Weiss, the inclusion of experience (proportion of all IPO's in market for which lead manager has been involved) adds an additional dimension that is particularly relevant for smaller emerging markets where gross proceeds, alongside IPO order flow itself, can be erratic in size and frequency. This forms my third contribution to literature.

Using a unique and comprehensive hand-collected sample set of 86 IPO firms from across North African equity markets, namely Egypt, Morocco, Tunisia and Algeria from 2000 to 2013 I find substantial evidence supporting the Brennan and Franks (1997) insider control hypothesis. While certification effected are likely achieved through IPO firms engaging with foreign VC managers leading to a reduction in underpricing the opposite is true of domestic VC. Similarly foreign lead managers reduce underpricing while elevated lead manager reputation is associated with significantly higher underpricing. This evidence would allude to the employment of domestic VC managers, and

4

domestic lead managers, who score more highly in reputational terms, in terms of stimulating excess demand for shares offered. This excess demand can be used to facilitate discriminatory rationing to prevent the coalescing of small block shareholder who be incentivized to monitor dominant insider groups. This assertion is further confirmed by rates of oversubscription being as high as 10,000% for some IPOs in Morocco alone. In this light IPO underpricing can be viewed as the permissible degree of wealth transfer that controlling insider groups are prepared to accept in order to retain control. In terms of the highly socially networked economies of Maghreb region it is reflective of the softer extension of control across more disparate entities and firms constituent to extended family business groups, such as shared directors, mutual socialization of boards, shared CEO and Chairpersons as well as elaborate network of pyramid and cross-shareholdings as opposed to the concentrated cash flow ownership within firm as envisaged by Brennan and Franks (1997) and Smart and Zutter (2003). A further key finding is that IPO underpricing across North Africa's socially networked economies is strongly associated to institutional quality, as defined by the six well-established World Bank Governance measures. In particular IPO underpricing is strongly reduced by increases in state-level corruption control. It is equally reduced, albeit by a smaller degree, with improvements in government effectiveness, defined as ability of government to formulate and enact policies, political stability and rule of law. This would lend support to the findings of Boulton et al (2010) that IPO underpricing is influenced by elevated private benefits of control which is closely linked to asymmetric information of firms listing. Finally we find evidence that foreign VC managers are more likely to be exclusively associated with foreign lead managers in IPOs while business angels are more likely associated with foreign VC and less likely with their domestic VC counterparts. This further alludes to constrained nature of domestic VC entities in smaller emerging economies that are characterised by highly socialized inter-relationships and business groups.

I proceed with the next section outlining the key institutional characteristics of North African equity markets. Section 3 outlines theory and hypothesis construction while Section 4 outlines data and methods. Section 5 discusses the results and the final section concludes.


## 2. Institutional characteristics of North African equity markets

The capital markets of North Africa are some of the oldest on African continent with the Bourse de Casablanca established in 1929 while Egypt's Alexandria bourse was formed in 1885 followed by Cairo's stock exchange in 1903. The two latter exchanges were the forerunners to the current integrated Egyptian exchange. However the governance of all of the Maghreb region's exchanges alongside many of the key actors in the respective markets is largely reflective of the business environments within which they are embedded. The boards of national stock exchanges are primarily composed of directors representing brokerage houses that are members. Many of these in turn are

themselves constituent to much more extensive business groups, often centred on families, that permeate both public sector (state) and private sectors. Inspection of domestic VC entities and their descriptions outlined in IPO firms listing prospectuses from across the region reveals a similar picture. Here open ended VC funds, termed as SICAV or SICAF in Morocco and Tunisia, are comparably structured to their European and North American counterparts with general partners acting as private equity operators, or managers, and limited partners participating in funds as investors. Funds such as the Maghreb private equity fund I and II may be domiciled in Cyprus or Switzerland. However control over various funds is vested in general partners, themselves linked to underlying family business group, and often the majority of limited partner investment is from same, or closely linked, business group. This network control and influence permeating through Moroccan and Tunisian economies is also underscored by equally subtle distinctions in the involvement in IPO firms by entities such as Morocco's CDG and SNI. The latter in particular being 100% owned by Moroccan state can take the form of formal state-participation in IPO firm's ownership structure or that of an actively managed and involved VC manager. However participation by the latter SNI entity is more ambiguous. This is wholly owned by King Mohammed VI as a personal investment vehicle and both engages in VC and private equity investment while also forming a sizeable business group, including entities such as Attarijariwafa Bank and related lead managers and subsidiary network, themselves organized as a sub-business group. It is also an active partner in SOMED, a private equity joint venture with a Saudi Arabian sovereign entity.

Extended family business groups are a prominent feature across all Maghreb countries and while those emanating from state and quasi-state sources in Morocco and Tunisia invest in centrally determined patterns, determined by state and its representative elites, along the lines of the Dirigiste (state-led) capitalist tradition, Egypt is different. The business environment of Egypt has largely been shaped by the adoption of socialism and subsequent nationalisation of industries, including large family conglomerates, during the 1960's under General Abdel Nasser. IPO order flow in this country has thus been largely made up from the divesting of state holdings, vested through various government ministries, themselves acting as holding entities for a wide range of previously nationalized industries, and the re-emergence of older Egyptian families, such as Sawaris, retaking control over their formerly state-controlled assets.

There are some notable regulatory differences across North Africa's equity markets. Egypt is notable in following the self-regulatory model, in line with many English-speaking countries despite its legal and governmental system being based on that transplanted by Napoleonic France. The Egyptian Financial Services Authority has surveillance oversight over the operations of Egyptian stock exchange alongside an array of sanctions against behaviour by participants deemed detrimental to maintenance of orderly market (EFSA website, 2013). IPO prospectuses are formed by firms from

the employment of independent auditors and accountants with IPO itself managed by a team of lead managers, book runners, and brokers in order to precipitate minority investor order flow. However in marked contrast to this self-regulatory model the regulatory bodies in Morocco and Tunisia have considerably more influence in listing process. One notable feature of prospectuses resulting from this more intrusive involvement is the publication of valuation techniques used to gauge size of discount factor, itself used to discount future projected cash flows thereby giving rise to issue price of shares. In contrast this is completely omitted in Egypt. The Conseil Déontologique des Valeurs Mobilières (CDVM, 2013), in Morocco, Conseil du Marché Financier (CMF, 2013), in Tunisia, and Commission d'Organisation et de Surveillance des Opérations de Bourse (COSOB, 2013), in Algeria, all analyse prospectuses, accounting and auditing information and accuracy of valuation techniques used in IPO prospectuses prior to issuing a "visa" permitting the IPO to be undertaken. Thus the primary markets in these Francophone countries are subject to considerable state-centred control. A final distinctive feature between Egypt and it's Francophone neighbours is the ubiquitous presence of a dedicated underwriting industry. The Francophone markets all exclusively use a dedicated "syndicat de placement", formed from members of the local brokerage community, and managed by the Chef de File of the IPO. Often different syndicates are formed, depending on expertise of constituent members, for each listing component, with these typically being characterized as proportions of shares marketed at employees, domestic retail, domestic institutional and foreign institutional investors alike. The placement of offered shares between each set of dedicated investors is undertaken on a rotational basis until all available offered shares are allocated during this process.

## 3. Background literature and hypotheses

The IPO process exposes considerable incongruity and conflict between the motivational goals of participants to that process – be these inside the firm, such as insider groups and executives as well as private equity entities, or outside the firm in the case of Lead Managers (Chef de File), placement syndicate members, brokers and other external market entities. Arthurs et al (2008) outlines that the central focus of traditional agency theory is that insider groups to the firm are core to agency costs and thus extends this theoretical perspective to take into account divergent goals and investment time horizons of various entities that are reflected in differences in decision-making and ultimately reflected in levels of underpricing. As such Arthurs et al (2008) introduce multiple agency theory, an extension of behavioural agency (following Wiseman and Gomez-Mejia, 1998) in focussing primarily on the nexus of relationships emanating from the underwriter employed for the IPO. However a major shortfall in the Arthurs study alongside applications such as Bruton et al (2010) is that the focus is on very large, well established capital markets in developed countries with relatively flat political economies. Here separation of ownership from control is largely as envisaged by Berle

and Means (1932) through widely dispersed principals (owner-shareholders) and managerial agents incumbent to the firm. This is also a critical implicit assumption in the "insider control" hypothesis first proposed by Brennan and Franks (1997) within the context of the UK equity market. However significant evidence questioning this form of separation of cash flow ownership from control (voting rights) was first raised by Claessens et al (2000) in a study of East Asian corporations. The findings revealed separation of ownership from control was achieved through pyramidal schemes and further reinforced through extensive cross-shareholdings while softer managerial socialization measures were also apparent, such as shared directors and CEO/Chairpersons between firms. Similar evidence of extended business groups formed in this manner has since been found across both North Africa, in Hearn (2011, 2013), but also across the wider continent of Africa (Hearn, 2013a). As such North Africa provides an ideal environment within which to extend the theoretical basis arising from nascent multiple agency perspective. Countries across the region are largely dominated by handfuls of social elites empowered at independence and who form the backbone of local political economies, the national institutions are principally shaped by French civil code law legal and governmental systems. While these promote the central role of state in credit allocation nationally, the permeation of both state architecture as well as private sector realms by extensive business groups underscores the extent of control of social elites across the region. Thus the proliferation of business groups based on handfuls of dominant families are both a product of centralising role of state as engendered in French civil code law systems and dirigiste economic model as well as notions of morality and social justice reflected from deeper Islamic shari'ya law religious customs. However a very recent literature arising from work of Khanna and Palepu (2000) and Khanna and Yafeh (2007) provides evidence that business groups are strategically advantageous in forming private equity and venture capital entities within the group, through being able to draw on superior resource capabilities of the group in business environments characterized by institutional deficiencies. Thus the IPO event in North Africa involves the interplay of relationships based on influential Chef de File, charged with the management of the listing, their charged role of forming share placement syndicates, where indigenous brokerage firms are chosen to form a syndicate to market newly issued stock to various designated classes of investor, and finally domestic VC entities that in being insiders to the focal IPO firm are also privy to otherwise costly information regarding true value of firm and quality of management. The domination of often extremely narrow indigenous political economies by handfuls of social elites, themselves tied to large dominant family groups, is reflected in the proliferation of their business groups throughout the economy with these exerting a controlling influence over lead managers, domestic VC entities and the often highly concentrated stock broker community that routinely forms placement syndicates in IPOs. Conversely foreign VC entities and business angel investors are not subject to the same political economy constraints as their domestic VC counterparts.

There are also likely to be similarly differing motivations behind the employment of foreign lead managers (Chef de File) and lead managers with higher reputations, given the reputational measure is based on share of IPO gross proceeds raised and frequency of stock issues with which manager has been involved. Hence a combination of this complex interplay of inter-relationships and consideration of the dominant forces of underlying political economy justify the application of a combination of nascent multiple agency perspective and signalling theories.

## 2.1. The contrasting effects of different private equity entities on IPO firm underpricing

Megginson and Weiss (1991) argue that corporate insiders have considerable incentives for not revealing the true value of a firm and its assets as they can potentially sell securities for a higher price than their true value. As such underpricing is the level of compensation sought by rational outside investors who know they have an informational disadvantage against insiders (Carter and Manaster, 1990). However underpricing represents a wealth transfer to outside investors and infers less cash with which the firm can use for more productive internal investment. One method of overcoming the considerable asymmetric information between outside investor and incumbent insiders is through the latter undertaking credible signals regarding the quality of the firm (Leland and Pyle, 1977). However Megginson and Weiss (1991) argue that a major problem with this is that insiders have everything to gain from falsely signalling and while Tinic (1988) argues that disclosure regulation is likely to discourage flagrant omissions and fraud, outside investors are more likely to accept signals from a third party which has considerable reputational capital at stake through the conveyance of inaccurate information.

Extending these arguments on the certification role of credible third parties and private equity is strategically placed to undertake this role. However while there is a considerable literature studying the impact of VC entities, very little is known about the governance impact of business angel (BA) investors (Bruton et al, 2010). These individual investors are often not motivated by potential financial reward from investing in firms but rather because of the "fun" of investing in an entrepreneurial venture and being able to socially interact informally with a fellow entrepreneur (see Mason and Harrison (2002) and Maxwell et al (2011) for comprehensive review of very recent literature regarding these investors). BA investors are notable as this class of investor are already successful entrepreneurs in their own right and thus when investing are doing so as their own principals (not agents to their own investors in turn) (Bruton et al, 2010). BA investors will have considerable reputational capital at stake given their intentions of becoming successful serial angel investors and thus generating further future order flow from other entrepreneurs, they will act to reduce agency costs with minority outside investors entering firm for first time at IPO (Bruton et al, 2010). As such BA investors presence is more likely to act as a credible third party signal to

minority outside investors thereby reducing agency costs and signalling quality and true value. Consequently I test the following hypothesis:

**H-1.1**: Presence of BA is negatively associated with IPO-firm underpricing

VC entities in contrast to BA investors are rarely principals (owners) of their own investment funds and are commonly agents acting on behalf of their own principal investors (Balboa and Marti, 2007). There are also considerable differences in the structure and type of VC activity and ownership worldwide (Bruton et al, 2005). Bruton et al (2005) details that VC entities in French civil code law countries are in particular more likely to be structured as extensions of existing banks in contrast to VC taking the form of general partners undertaking the investment decisions while benefiting from investment by limited partners participating in VC funds. Furthermore evidence from Khanna and Palepu (2000) and Khanna and Yafeh (2007) reveals that the optimal coordinative ability of business groups is frequently associated with their within-group establishment of private equity, and particularly VC, entities. However an overriding feature of domestic VC is that given the considerable permeation of both public and private sectors in smaller emerging economies with social elites, who themselves are affiliated to dominant family groups, and the ubiquitous nature of extended family business groups throughout economy that this type of VC is likely to be subject to considerable political constraint. Furthermore domestic VC entities that are not subject to the overlapping extended control of family-controlled business groups are likely to be subject to considerable institutionalized mimetic and coercive pressures constraining their behaviour as investors and their interaction with other market participants. Thus domestic VC entities are less likely to be motivated to signal quality and thus reduce agency cost but rather to engage in underpricing as a means of facilitating the retention of control by insiders, with whom they are inextricably socially tied. As such I test the following hypothesis:

**H-1.2**: Presence of Domestic VC is positively associated with IPO-firm underpricing

In direct contrast to domestic VC, foreign VC managers are not subject to domestic political and ownership constraints that distort incentives to signal quality and engender collusive behaviour with other market participants through social ties prevalent in narrow political economies within which Maghreb markets are embedded. As such the agency costs associated with foreign VC managers is more consistent with their achieving maximum returns on investments and thus undertaking high quality monitoring through active involvement in investee firms. As such there is greater congruence

in motivations behind signalling true value of firm and its management which in turn leads to a reduction of agency costs. Consequently I test the following hypothesis:

**H-1.3**: Presence of Foreign Venture Capital is negatively associated with IPO-firm underpricing

## 2.3. Lead manager effects on IPO firm underpricing

The two primary measures of reputation in the literature are based on measures introduced by Megginson and Weiss (1991) and Carter and Manaster (1990). These were introduced in the context of the role of underwriters in the large, well developed US equity market. The former is based on a simple share of gross proceeds raised in IPOs with which the underwriter has involvement while the latter is based on the prestige of relative position in the tombstone lists of underwriters common to the front page of IPO firm listings prospectuses. While both studies find evidence of an inverse relationship between underwriter quality and underpricing leading to a conjecture that higher quality underwriters are more effective in sending credible signals of quality to outside investors thereby reducing agency costs and the need for underpricing as a compensation measure for informational asymmetry. However in direct to contrast to these findings from the large, well developed US market that benefits from being socially embedded in a relatively uniform political economy, the narrowness of emerging economies polities that are commonly dominated by handfuls of social elites underscores the necessity in considering other motivations. In line with the Brennan and Franks (1997) thesis of "reduced monitoring hypothesis" effected through underpricing that in turn stimulates excess demand for shares offered at listing which in turn enables the discriminatory rationing of shares thereby preventing possibility of small block shareholders coalescing. This "reduced monitoring hypothesis", or insider control thesis is of particular important in economies underscored by family-controlled business groups where insider control is effected through a variety of mechanisms by which ownership is separated from control which are acutely sensitive to the formation of block shareholder groups with the motivation to question and effectively monitor insiders. As such in this context lead managers with elevated reputations are more likely to be employed by IPO firm in order to effect "insider control". Consequently I test the following hypothesis:

**H-2.1**: Lead Manager reputation is positively associated with IPO-firm underpricing

In direct contrast to the "reduced monitoring hypothesis" argument of Brennan and Franks (1997) for lead managers with elevated reputation, signalling arguments dominate in terms of the employment of foreign lead managers by IPO firm. Foreign lead managers are better placed to signal quality in

part to domestic investors through their ability to act as a conduit for international best practice in terms of governance and transparency but also in terms of marketing ability in being able to attract overseas investors through the enhanced visibility, reputational capital and recognition of their brand. Consequently I test the following hypothesis:

**H-2.2**: Presence of Foreign Lead Manager is negatively associated with IPO-firm underpricing

## 2.4. Impact of institutional quality on underpricing

Boulton et al (2010) extend the theoretical "reduced monitoring hypothesis" argument originally developed by Brennan and Franks onto a cross-country international setting and in particular to the role of differing institutions worldwide. As such the Boulton study argues that private benefits of control are easier for insiders to conceal while they can also act with relative impunity in environments characterised by weak institutions thus leading to a reduced need for underpricing as a form of compensation to minority outside investors. Conversely increasing institutional quality has the opposite effect inferring a need for insiders to transfer wealth through underpricing so as to attract minority investors. However a major shortfall in reduced monitoring hypothesis of Brennan and Franks is that it only considers insider control from viewpoint of higher cash flow ownership, and hence via the assumption of single class shares with uniform voting rights, control. As such it is wholly based on the premise of Berle and Means (1932) of separation of ownership from control being achieved through genuine dispersion (diversification) of ownership. However in stark contrast to this Claessens et al (2000) found substantial evidence of the separation of ownership from control being achieved almost universally across East Asia not via diversification but rather through pyramidal schemes, extensive networks of cross-shareholdings and softer techniques involving socialization and shared directors. These alternative techniques for achieving separation of ownership from control are particularly prevalent in extended family business groups whose constituent members are mutually bound together through often powerful altruistic bonds to the family as a whole. Consequently this method of separation of ownership from control is inherently different from that envisaged originally by Berle and Means in their work on US equity market and thus is relatively resistant to differences in state-level institutional quality. This view is also supported by anecdotal evidence that North African countries have always had some of the highest institutional quality of the entire continent of Africa with Tunisia and Morocco being comparable in quality to Western European countries such as Spain and Portugal all the while the economies were formed from extended family-controlled business groups (Hearn, 2011, 2013). Further support can be obtained from the Boulton study given their multi-country sample is almost wholly dominated by very large, developed markets of US, UK, Australia, France, Germany, Singapore and Japan with no

African or Middle Eastern countries present. As such I argue that underpricing will be more associated with asymmetric information generated from lower levels of state-level institutional quality. In this light lower levels of institutional quality both informally disadvantage minority investors while also hindering their ability to prosecute detrimental actions taken by insiders. In further contrast to the Boulton study which employs a variety of very different institutional indicators from equally different sources, I use the six well-recognized World Bank Governance (World Bank Governance, 2012) institutional quality measures. These are: democratic voice and accountability, effective government, control of corruption, political stability and absence from conflict, regulatory quality and rule of law. Consequently I test the hypotheses:

**H-3.1**: Corruption control is negatively associated with IPO-firm underpricing

**H-3.2**: Effective Government is negatively associated with IPO-firm underpricing

**H-3.3**: Political Stability is negatively associated with IPO-firm underpricing

**H-3.4**: Regulatory quality is negatively associated with IPO-firm underpricing

**H-3.5**: Rule of Law is negatively associated with IPO-firm underpricing

**H-3.6**: Voice and Accountability is negatively associated with IPO-firm underpricing

## 2.5. Impact of business angel and venture capitalist retained ownership on underpricing

Retained ownership immediately following the IPO by either insiders or private equity entities is a very effective and credible signal of the true quality of the focal firm and its management (Leland and Pyle, 1977). Retained ownership is costly on the part of insiders and private equity entities as this represents their forfeiting the first opportunity to maximise their own personal gain for liquidation of their investment (Bruton et al, 2010). As such it is also indicative of the underlying motivations behind the underpricing for the various different categories of insider investor. BA investors in particular have little to gain other than signalling quality through their retaining ownership post-IPO. This class of investors act as their own principals (owners of the funds they invest) and as such their retained involvement in IPO firms signals the maintained benefits to the focal firm from their superior monitoring (Bruton et al, 2010). Consequently I test the following hypothesis:

**H-4.1**: Business Angel retained ownership is negatively associated with IPO-firm underpricing

Foreign VC managers have a similar degree of independence in terms of their decision making although this arises from having their being agents with principals located overseas (see Balboa and Marti (2007) for full review of agency in VC investment) and not subject to the cultural and

socialized norms of the local indigenous political economy. Consequently foreign VC managers are more likely genuinely focussed on signalling undertaking signals to the market that would be otherwise costly to imitate (see Certo (2003) for full review of signalling). As such I test the following hypothesis:

**H-4.2**: Foreign VC retained ownership is negatively associated with IPO-firm underpricing

However in direct contrast to BA investors and foreign VC entities that benefit from a relatively high degree of independence in their investment decisions, domestic VC is much more intricately tied to the local political economy. This is through domestic VC entities either being owned, controlled or subject to considerable influence by extended family groups and social elites that form the local Maghreb political economy. Consequently motivations to signal quality are subsumed by those aimed at retaining the control of insiders within the firm (Brennan and Franks, 1997), who are often socially linked to the domestic VC entity, either through belonging to same family business group or being part of overlapping network of family business groups. Consequently I test the following hypothesis:

**H-4.3**: Domestic VC retained ownership is positively associated with IPO-firm underpricing

## 3. Data and Methods
### 3.1. Data

The dataset constructed and used in this paper represent a comprehensive list of all IPOs undertaken on each of the national stock exchanges of the North African region, namely Algeria, Egypt, Morocco and Tunisia for the period 2000 and 2013. The evidence in Table 1 reveals that listing activity is sporadic owing to the smaller size of these markets with large periods of inactivity such as between 2000 and 2005 in Egypt and 2000 and 2004 in Morocco. The smallest of the exchanges, Algeria, has failed to attract any listings since the period immediate following its inception in 1999/2000. Tunisia in contrast has had a very small but steady stream of listings over the sample period. Consequently a total of 86 IPOs are included in the sample period.

**Table 1**

Flotation prospectuses were hand-collected from financial market regulator websites for Algeria and for Morocco while a combination of Thomson Corporation Perfect Information and Al Zawya databases were used to source Egyptian prospectuses. Al Zawya database, the national stock exchange and direct contact with individual firms were used to source prospectuses for Tunisia. We

exclude readmissions and transfers of listings between main and development boards while also excluding demergers, reorganizations and flotations of preferred stock, convertibles, unit and investment trusts. Consequently the final sample is composed of 86 IPO firms that floated ordinary shares with single class voting rights. Share prices were obtained from Bloomberg, DataStream and Al Zawya as well as direct from the national stock exchange in Algeria. US$ Exchanges rates were obtained from Bloomberg. The conversion of all values into US$ assumes long term parity between local currencies and US$ and mitigates against domestic inflation.

## 3.2. Variable Measurement

Dependent variable: underpricing

Initial returns are used as the measure of IPO firm underpricing. It is notable that there is considerable evidence of significant illiquidity, reflected in market inactivity and price rigidity, across all North African equity markets (see Lagoard-Segot (2013) for liquidity study on Tunisia, Ghysels and Cherkaoui (2003) for Morocco and Hearn (2010) for Egypt and Algeria as well as Tunisia and Morocco). As such I follow Carter and Manaster (1990) and Filatotchev and Bishop (2002) in using initial returns calculated using the market-determined stock price at both 1 and 2 weeks following listing (issue price):

$$IPO\,Underpricing_i = \left[Closing_{t,i} - Issue_i\right]/Issue_i \qquad (1)$$

where $Closing_{t,i}$ is the closing price of firm i stock after t weeks (these being 1 and 2 weeks respectively) and $Issue_i$ is the issue price for the stock of firm i.

Controls

Firm controls

Natural logarithm of Tangible Assets: The natural logarithm of firm tangible assets in the pre-IPO year in US$ is a proxy for firm size in terms of tangible assets. It was obtained from the IPO prospectus. While this provides a direct measure of firm size it also has inferences at the stage of development of the firm's activities and progression through the firm's lifecycle (Berger and Udell, 1998).

Natural logarithm of firm age: This is the number of years from establishment of firm to year IPO was undertaken. This variable also has inferences on the development of firm's through their lifecycles which in turn has implications for informational asymmetry (Berger and Udell, 1998).

Natural logarithm of revenues: The natural logarithm of firm revenues in the pre-IPO year in US$ was obtained from the IPO prospectus. Firm revenues are long established in the literature as a control for the variation in size as larger firms have greater economic growth opportunities (Rosen (1982); Smith and Watts (1992)).

Debt to Equity ratio: This is the ratio of all balance sheet liabilities (short and long term debt) to total shareholder equity as stated in listings prospectus for the year preceding IPO. This has important inferences in terms of firm financing, which is closely related to its progression through lifecycle (Berger and Udell, 1998).

IPO and Ownership Controls

Shares offered divided by total shares: This is a proxy for the size of the offer and is calculated as the number of shares offered divided by the total shares issued and outstanding. This is justified by evidence from Ritter (1984) of a persistent relationship between initial returns, or underpricing, and size of offering while Ritter (1987) has documented economies of scale in the costs of listing. These variables are obtained from IPO listings prospectus.

Privatization: This is a (1/0) dummy variable taking value 1 if IPO is a privatization of former state owned enterprise and 0 otherwise.

Foreign Partner: This is a (1/0) dummy variable taking value 1 if IPO is the listing of a joint venture or subsidiary of a foreign firm and 0 otherwise.

Owner = Lead Manager: This is a (1/0) dummy variable taking value 1 if the ultimate owners of the focal firm undergoing IPO is the same ultimate owner of lead manager employed and 0 otherwise. This variable in particular controls for the frequent co-ownership of business entities and market participants across the very small markets in Maghreb region.

Institutional Quality: I use a simple aggregated index formed from equal weighted mean of the six well established World Bank Governance institutional quality indices disseminated by World Bank. These have first been rescaled to dimensions of 0 to 10 to facilitate comparability. The six measures are: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. The construction and definition of each of the six indicators is outlined in detail on World Bank Governance website (World Bank Governance indicators, 2012) as well as in Hearn and Piesse (2013) and Hearn (2013).

### 3.3 Impact of private equity and lead managers on underpricing

Hypotheses 1-1 to 1-3 and 2-1 to 2-2 respectively are tested using pooled cross sectional OLS regressions. Country and industry fixed effects are applied. The former controls for latent differences across countries while the latter control for pervasive differences across industries. The focal variables outlined in hypotheses are defined as:

BA: This is a (1/0) dummy variable taking value 1 if business angels were involved in IPO firm and 0 otherwise.

Domestic VC: This is a (1/0) dummy variable taking value 1 if domestic VC were involved in IPO firm and 0 otherwise.

Foreign VC: This is a (1/0) dummy variable taking value 1 if foreign VC were involved in IPO firm and 0 otherwise

Lead Manager reputation: The final reputation measure is the equally weighted aggregate of two sub-measures. The first of these is constructed as the cumulative market share defined as the ratio of total amount raised by firms with that particular lead manager to the total raised across the market in line with Megginson and Weiss (1991). So for the universe of all lead managers (or Chef de File), i, in each respective national stock market, the total gross proceeds raised across all IPOs throughout the entire sample time period, adjusted to its natural logarithm, is denoted as $\sum_{t=0}^{\infty} \ln(x_i)$. We define the total attributed to each individual lead manager, denoted as j, throughout the entire sample time period, and again converted to its natural logarithm as $\sum_{t=0}^{\infty} \ln(x_j)$. The lead manager reputation ($LR-1_{jt}$) rank of each lead manager is given by expression 2 below:

$$LR-1_{jt} = \frac{\sum_{t=0}^{\infty} \ln(x_j)}{\sum_{t=0}^{\infty} \ln(x_i)} * 100\% \tag{2}$$

The second sub-measure employs the same principle in gauging the frequency of IPOs within which each individual lead manager has been involved, even as a co-lead or operating as part of a syndicate, against the total number of IPOs in the market. As such expression 2 is modified so $\sum_{t=0}^{\infty} x_j$ is the total number of occurrences for each individual lead manager in IPOs within the national market, delineated as a 0/1 dummy where if lead is involved it is attributed value of 1 and 0 otherwise.

$\sum_{t=0}^{\infty} x_i$ merely indicates the total number of IPOs in the national market during the sample time period. The final sub-measure for proportional ranking of IPO involvement and experience ($LR-2_{jt}$) is given in expression 3 below:

$$LR-2_{jt} = \frac{\sum_{t=0}^{\infty} x_j}{\sum_{t=0}^{\infty} x_i} \divideontimes 100\% \qquad (3)$$

Following the equally weighted aggregation of both sub-measures detailed in expressions 2 and 3, the aggregate reputation measure is superior to the Megginson and Weiss (1991) measure in being multi-dimensioned (experience and share of proceeds) which is preferable in emerging economy IPOs as these are subject to considerable variation in size of offering and frequency.

Lead manager foreign: This is a (1/0) dummy variable taking value 1 if lead manager involved in IPO is foreign and 0 otherwise

Each of the above focal variables are applied in turn to a pooled cross sectional OLS regression which contains all the control variables (firm as well as IPO and ownership) outlined in previous section 3.2. The dependent variable in each case is underpricing.

## 3.4. Impact of institutional quality on underpricing

Hypotheses 3-1 to 3-6 are tested using pooled cross sectional OLS regressions with both country and industry fixed effects applied. However first the aggregate institutional quality measure (formed as an aggregate) is omitted before each of the six World Bank Governance institutional quality measures, defined previously in section 3-2, are sequentially added in turn to each model. Owing to significant correlation and concerns of multi-collinearity between these measures they are not included altogether in a grand regression. The institutional quality testing builds upon previous section which is reflected in all of the previous section's focal hypothesis variables, namely BA, Domestic VC, Foreign VC, Lead manager reputation, Lead manager foreign, being included jointly as market factors alongside all of the firm, IPO and ownership controls outlined in section 3-2.

## 3.5. Effects of retained business angel and venture capitalist ownership on underpricing

Finally hypotheses 4-1 to 4-3 are tested using two-stage least squares (2SLS) models owing to endogeneity and potential reverse causation and feedback between block-ownership post-IPO and levels of IPO firm underpricing. Kaserer and Moldenhauer (2008) assert that market determined outcomes of block-ownership post-IPO are significantly less likely in civil code law countries owing

to the underdeveloped nature of markets which somewhat mitigates the likely endogeneity this still have to be taken into account with the appropriate selection of methods which involves using separate exogenous instrument variables. The ownership variables associated with hypotheses are defined as follows:

BA own post-IPO (%): This is ownership by BA post-IPO as stated in prospectus

Domestic VC own post-IPO (%): This is ownership by domestic VC post-IPO as stated in prospectus

Foreign VC own post-IPO (%): This is ownership by foreign VC post-IPO as stated in prospectus

Two-stage least squares (2SLS) is a special case of instrumental variables regression. This employs two distinct stages with the first stage finding the portions of the endogenous and exogenous variables that can be attributed to the instruments. This stage involves estimating an OLS regression of each variable in the model on the set of instruments. The second stage is a regression of the original equation, with all of the variables replaced by the fitted values from the first-stage regressions. The coefficients of this regression are the 2SLS estimates. The instrument variables are defined as follows:

Instrument Variables
Number of true independent nonexecutives: This is the number of nonexecutives for whom there is no evidence in listings prospectus alluding to their affiliation in any way to CEO or controlling/ dominant block-shareholders who commonly have board representation

Natural logarithm of employees: This is the natural logarithm of the total number of employees or staff of the focal IPO firm in year immediately preceding IPO

Number of business angels: This is the number of business angel early stage investors as declared in listings prospectus.

Family firm: This is a dichotomous variable taking value 1 if firm is family controlled and 0 otherwise

## 4. Empirical Results

## 4.1. Descriptive statistics

The evidence from Table 2 reveals that levels of underpricing across Egypt, Morocco and Tunisia are generally between 20 – 30% while that in Algeria is extremely low reflecting a minimal stock market culture and awareness in business environment and hence extremely small size and activity of market with extreme illiquidity. More generally all three forms of private equity target business groups and entrepreneurial firms led by CEO-Founders. There is also significant evidence of industry specialization with the industries of finance, cyclical consumer goods, technology and energy accounting for over 70% of private equity activity in IPO market. Finally the number of foreign VC entities in the region's IPO market is small and relatively dispersed in type (agency, state, fund or bank-based). However there is some specialization in domestic VC with state and agency based venture capital common in Morocco, state and bank-based venture capital in Egypt and an exclusive focus on agency venture capital in Tunisia (reflected in SICAV/SICAF funds)

**Table 2**

Table 3 outlines the top ten BA, domestic VC and foreign VC investors for each of the three principal North African markets, namely Egypt, Morocco and Tunisia. Generally there is a minimal participation of foreign VC across all three markets, although it is notable an Egyptian IPO firm was target of US entity Goldman Sachs and Morocco is subject to target investment from Tunisia. More generally equity investment (stake) values are least in the case of BA investors and foreign VC and largest in case of domestic VC. Average levels of divestment at IPO are also highest across BA investors and foreign VC with this being generally lower for domestic VC. This would provide some evidence that foreign VC and to a lesser extent BA investors perceive IPO as a viable exit from investee firms.

**Table 3**

## 4.2. IPO Firm underpricing

The evidence from Table 4 reveals a lack of any support for hypothesis 1-1 while also revealing strong statistical support for hypotheses 1-2, 1-3, 2-1 and 2-2. The evidence is particularly strong as all relationships maintain their size, direction (sign) and level of statistical significance (over 95% confidence margin) in both the individual models (models 2 to 6) as well as the grand regression model which includes all hypothesized focal variables together (model 7). Further support arises from the considerable increases in explanatory power ($R^2$) in models with each of the focal hypothesized variables, on top of controls, in models 3 to 6, over and above the explanatory power for model 1 which only includes controls. Overall these results infer significant support for the "reduced monitoring hypothesis" of Brennan and Franks (1997), in relation to positive relationship

between domestic VC and lead manager reputation and increased underpricing, while the signalling or certification role of foreign VC and lead managers is dominant in reducing underpricing as argued by Certo (2003).

In terms of the controls and the positive relationship there is a large, positive and statistically significant (95% confidence level) association between underpricing and tangible assets while a negative and smaller association, generally one tenth of the absolute coefficient size) and of equal significance is present between underpricing and debt-to-equity ratio. These results infer that underpricing is more common in larger sized firms as well as those that are more reliant on equity (as opposed to debt) financing. In terms of the IPO and ownership category of controls and there is a large, negative and weakly statistically significant association (90% confidence level) between underpricing and ratio of shares offered to total shares issued. This provides some further, albeit weak support for the reduced monitoring hypothesis where smaller share issues reflect deeper underlying motives concerning retention of control and thus minimal issuance of shares. There is a very large, negative association with equally high statistical significance (99% confidence margin) between underpricing and aggregate institutional quality. While this result lends further tacit support for the reduction in asymmetric information (owing to higher institutional quality) leading to decreasing motivation for underpricing as a means to compensate minority investors, it is subject to further study through its six disaggregated World Bank Governance component institutional quality measures in the next section 4-3. The large, negative association between underpricing and privatization dummy, which has variable statistical significance across models 1 to 7, reveals a contrasting relationship to that expected from Boulton et al (2010). Consequently in North Africa state divestments through privatization is more likely to leave more funds available to corporate insiders. However it should be noted that privatized firms are relatively well known brands, and thus attract considerable attention of minority investors, while also insider motivations for exerting control via underpricing being used as a tool to stimulate excess demand for shares, as evidenced in Appendix Tables 1 and 2, and hence discriminatory rationing, is less prevalent than in private family business groups. This is largely due to the separation of ownership from control being more directly in line with that envisaged by Brennan and Franks (1997), with state having concentrated cash flow ownership, as opposed to the separation being achieved through pyramids and cross-shareholdings which are especially sensitive to monitoring from minority block-shareholders. There is a small, positive association between foreign partner dummy and underpricing which only attains statistical significance, at 90% confidence level, in grand regression model 7. This infers some support for conjecture that firms with foreign partners, namely locally registered foreign joint ventures and subsidiaries, are likely to view underpricing as a means to stimulate demand so as to engender indigenization (local acceptability of brand) in shareholdings. Finally there is a very large, positive

21

and highly statistically significant association (99% confidence level) between underpricing and ultimate owner equals lead manager dummy. This evidence also lends further strong support to the Brennan and Franks reduced monitoring hypothesis in terms of underpricing being used ultimately to protect insider control.

**Table 4**

## 4.3. Impact of institutional quality on underpricing

Hypotheses 3-1 to 3-6 are tested through the sequential inclusion of each of the six individual World Bank Governance institutional quality measures on top of controls. The controls are a combination of all the controls used in previous section (models 1 to 7), i.e. firm controls alongside IPO and ownership controls (less the aggregate institutional quality measure), as well as the combination of all five variables that were the focal hypothesized variables again from previous section (as in final grand regression model 7). The evidence from Table 5 provides statistical support for hypotheses 3-1, 3-2, 3-3 and 3-5, i.e. increased underpricing is associated with lower corruption control, effective government, political stability and rule of law. In contrast hypotheses 3-4 (regulatory quality) and 3-6 (voice and accountability) are unsupported. However the strongest statistical support is for the negative association between corruption control and underpricing where the addition of corruption control measure over and above controls leads to an additional 8.7% increase in explanatory power ($R^2$). This single coefficient of association is the largest in absolute size (-2.894) with strongest statistical significance at 99-95% confidence margin. In contrast the coefficients of association for effective government and political stability are less than half the absolute size of that for corruption control with statistical significance dropping to 95% and explanatory power increase (over controls) dropping to under 4%. The rule of law association with underpricing is very weak and leading to an increase in explanatory power over controls of just over 1%.

The relationships between underpricing and all control variables are as documented in previous section 4.2. However one notable difference is the increase in absolute size and statistical significance of relationship between underpricing and foreign partner dummy further supporting previous evidence that this is likely due to indigenization of ownership as a motive for underpricing to generate necessary demand for shares offered.

**Table 5**

## 4.4. Effects of private equity and business angel retained ownership on underpricing

Finally the evidence from Table 6 reveals statistical support for all three hypotheses: 4-1 to 4-3. There is a negative and statistically significant coefficient of association between underpricing and the retained ownership of BA investors (-0.022) and foreign VC (-0.004) with both being statistically

significant, though this is at 95% confidence level in former and only 90% in latter. However there is a positive association between underpricing and retained ownership of domestic VC (+0.009) which is statistically significant at 95% confidence level. It is also notable that the explanatory power ($R^2$) is markedly lower in model 15 with only BA retained ownership, at 25.25%, while it is much higher for models 16 (30.44%) and 17 (32.43%) that include foreign and then domestic VC retained ownership respectively. These results are in line with anticipated relationships from hypotheses in terms of certification (signalling) of value being dominant motivation for lack of underpricing in IPO firms with BA and foreign VC involvement. I argue this is because these two private equity entities are relatively independent of domestic political economy forces, reflected in the Maghreb region by local economies being permeated with extensive (and often overlapping) family business groups. As such both BA and foreign VC retained ownership is associated with signalling of quality, in line with both Leland and Pyle (1977) and Certo (2003). In contrast however domestic VC is closely tied to the domestic political economy and hence underpricing is used to stimulate excess demand and thus discriminatory rationing of offered shares.

The relationships between underpricing and all control variables are again as documented in previous sections 4.2 and 4-3.

**Table 6**

## 5. Conclusions

This study provides a unique insight into the determinants of IPO firm underpricing in North Africa using a unique comprehensive and hand-collected sample of 86 IPOs from across the region, namely Algeria, Egypt, Morocco and Tunisia, between 2000 and 2013.

The findings suggest that while foreign venture capitalists and lead managers are more likely to signal high quality of focal firm and its management leading to reduced underpricing, the opposite is true of domestic venture capitalists and lead managers with elevated reputation. This is argued to reflect that foreign venture capitalists and lead managers are relatively independent of domestic Maghreb political economy which is overwhelmingly dominated by extended family groups and hence underscores their ability to signal quality free of political constraints. However given the highly networked nature of Maghreb economy the opposite is true of domestic venture capitalists and lead managers with elevated reputation, acquired through their selection to participate more frequently in IPO market. Here the reduced monitoring hypothesis of Brennan and Franks is maintained although its prescriptions are especially pertinent in firms where separation of ownership from control is achieved through pyramidal and cross-shareholdings rather than simple diversification. As such the findings from my study have particular relevance to both regulatory

authorities and investors in countries with political economies overwhelmingly permeated with extended family business groups such as much of Asia, Latin America, Middle East and Africa.

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Table 1. Number of IPOs in North Africa by market IPO activity, by market, from across North African region between 2000 and 2012.

| Year | Total | Algeria | Egypt | Tunisia | Morocco | | |
|---|---|---|---|---|---|---|---|
| | | | | | Marché principal | Marché développement | Marché croissance |
| 2000 | 5 | 3* | 1 | -- -- | 1 | -- -- | -- -- |
| 2001 | 5 | -- -- | -- -- | 3 | -- -- | 2 | -- -- |
| 2002 | 1 | -- -- | -- -- | 1 | -- -- | -- -- | -- -- |
| 2003 | 1 | -- -- | -- -- | 1 | -- -- | -- -- | -- -- |
| 2004 | 2 | -- -- | -- -- | -- -- | 2 | -- -- | -- -- |
| 2005 | 10 | -- -- | 3 | 4 | 2 | 1 | -- -- |
| 2006 | 13 | -- -- | 1 | 2 | 4 | 3 | 3 |
| 2007 | 15 | -- -- | 2 | 4 | 5 | 3 | 1 |
| 2008 | 10 | -- -- | 2 | 2 | 4 | 2 | -- -- |
| 2009 | 1 | -- -- | -- -- | 1 | -- -- | -- -- | -- -- |
| 2010 | 10 | 1 | 1 | 5 | 3 | -- -- | -- -- |
| 2011 | 4 | -- -- | -- -- | 1 | 3 | -- -- | -- -- |
| 2012 | 2 | -- -- | -- -- | 2 | -- -- | -- -- | -- -- |
| 2013 | 7 | -- -- | -- -- | 7 | -- -- | -- -- | -- -- |
| **Total:** | **86** | **4** | **10** | **33** | **24** | **11** | **4** |

Source: Compiled by author from national stock exchanges and regulators
Note: * includes IPO listing from 1999/1998

Table 2. Distribution of IPO underpricing by country and private equity activity

This table presents the distribution of IPOs and underpricing, or initial returns, statistics by listing country. Underpricing is calculated as the percentage difference between closing price at 1 and 2 weeks following listing and issue price as a proportion of issue price. Institutional quality is the aggregated value of the six individual World Bank Governance measures of institutional quality as developed in Kaufman et al (2009) and downloadable from http://www.govindicators.org.

| Overall Market | | Underpricing (1 week) | | | | | Underpricing (2 weeks) | | | | | Aggregate Institutional Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Median | Std. dev. | | | Mean | Median | Std. dev. | | | Mean | Median | Std. dev. |
| | $N_{IPO}$ | % | % | % | | $N_{IPO}$ | % | % | % | | $N_{IPO}$ | % | % | % |
| Egypt | 10 | 21.78 | 16.52 | 32.92 | | 10 | 20.99 | 12.02 | 37.15 | | 10 | 42.43 | 41.98 | 1.84 |
| Morocco | 39 | 18.94 | 16.19 | 24.54 | | 39 | 24.45 | 12.86 | 36.97 | | 39 | 46.94 | 46.80 | 1.56 |
| Tunisia | 33 | 27.07 | 21.43 | 27.06 | | 33 | 28.08 | 24.40 | 30.29 | | 33 | 50.84 | 50.38 | 1.73 |
| Algeria | 4 | 0.78 | 0.00 | 1.56 | | 4 | 0.78 | 0.00 | 1.56 | | 4 | 28.97 | 27.39 | 3.55 |

| Private Equity | | Target investment type | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Foreign VC | | | | | Domestic VC | | | | | Business Angels | | | |
| | | FP | State | Business Group | CEO Founder | | FP | State | Business Group | CEO Founder | | FP | State | Business Group | CEO Founder |
| | $N_{PE}$ | % | % | % | % | $N_{PE}$ | % | % | % | % | $N_{PE}$ | % | % | % | % |
| Egypt | 1 | 0.00 | 0.00 | 0.00 | 0.00 | 12 | 0.00 | 38.46 | 46.15 | 38.46 | 13 | 0.00 | 0.00 | 30.77 | 61.54 |
| Morocco | 3 | 0.00 | 0.00 | 33.33 | 33.33 | 24 | 10.34 | 10.34 | 75.86 | 55.17 | 11 | 0.00 | 0.00 | 63.64 | 36.36 |
| Tunisia | 7 | 42.86 | 0.00 | 85.71 | 57.14 | 22 | 0.00 | 4.00 | 44.00 | 56.00 | 13 | 30.77 | 0.00 | 69.23 | 61.54 |
| Algeria | 0 | -- -- | -- -- | -- -- | -- -- | 0 | -- -- | -- -- | -- -- | -- -- | 0 | -- -- | -- -- | -- -- | -- -- |

| Private Equity | | Type of Private Equity entity | | | | | | | | | | Top 4 target industries | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Foreign VC | | | | | Domestic VC | | | | | Domestic VC | | | |
| | | State | Agency | Fund | Bank | | State | Agency | Fund | Bank | | Finance | Cons Cyc | Tech | Energy |
| | $N_T$ | % | % | % | % | $N_{PE}$ | % | % | % | % | $N_{PE}$ | % | % | % | % |
| Egypt | 0 | -- -- | -- -- | -- -- | -- -- | 12 | 23.08 | 7.69 | 23.08 | 46.15 | 12 | 38.46 | 7.69 | -- -- | 53.85 |
| Morocco | 0 | -- -- | -- -- | -- -- | -- -- | 24 | 48.28 | 41.38 | 3.45 | 6.90 | 24 | 13.79 | 37.93 | 27.59 | -- -- |
| Tunisia | 2 | 0.00 | 50.00 | 50.00 | 0.00 | 22 | 0.00 | 80.00 | 4.00 | 16.00 | 22 | 20.00 | 28.00 | 24.00 | 4.00 |
| Algeria | 0 | -- -- | -- -- | -- -- | -- -- | 0 | -- -- | -- -- | -- -- | -- -- | 0 | -- -- | -- -- | -- -- | -- -- |
| US | 3 | 33.33 | 33.33 | 33.33 | 0.00 | | | | | | | | | | |
| UAE | 2 | 0.00 | 50.00 | 0.00 | 50.00 | | | | | | | | | | |
| Saudi Arabia | 3 | 0.00 | 0.00 | 100.00 | 0.00 | | | | | | | | | | |
| Italy | 1 | 0.00 | 0.00 | 0.00 | 100.00 | | | | | | | | | | |

Notes:  $N_{IPO}$ indicates number of IPO firms within category; $N_{PE}$ indicates number of private equity entities; $N_T$ indicates the number of Foreign VC in terms of country of origin

Table 3. Descriptive statistics of top ten private equity investors, per category, per country

This table contrasts the top ten private equity (PE) entities between the three Maghreb countries of Egypt, Morocco and Tunisia in terms of their mean level of divestment (difference between pre-IPO and post-IPO cash flow ownership) and mean (average) equity stake value, in US$m. The total number of PE entities, in each category, per country are detailed alongside the overall mean (average) levels of divestment and equity stake value, in US$m. It should be noted that all values are disaggregated to reveal the individual participation of individual PE entities in IPOs across the region as it is common for PE investment in target firms to adopt a consortium of several entities (both within same category i.e. a consortium of Foreign/Domestic VC or Business Angels as well as a consortium formed including a mix of these)

| Country | Foreign VC | Divest | Mean Equity stake | Domestic VC | Divest | Mean Equity stake | Business Angels | Divest | Mean Equity stake |
|---|---|---|---|---|---|---|---|---|---|
| | Name [Country of origin] | % | US$m | Name | % | US$m | Name | % | US$m |
| Egypt | Goldman Sachs [US] | 10.91 | 100.80 | Alexandria Bank | 30.76 | 1,297.98 | Abdelmoneim Al Rashid | 0.00 | 178.61 |
| | | | | Cairo Bank | 30.76 | 1,297.98 | Ola Lotfy Zaki | 26.00 | 84.35 |
| | | | | Egyptian for Insurance | 30.86 | 648.99 | Mohamed Abdullah M. Aldeghaim | 29.17 | 59.30 |
| | | | | Pension for Private Sector | 0.00 | 648.99 | Ahmed Amin Mahmoud El Abin | 27.66 | 58.06 |
| | | | | Misr Bank (incl. Misr Insurance) | 0.00 | 230.71 | Omar Mostafa Tantawy | 32.26 | 56.81 |
| | | | | National Bank of Egypt | 0.00 | 282.80 | Abdelaziz Al Saghir | 0.00 | 48.37 |
| | | | | Arab Co for Real Estate Dev. | 0.00 | 189.78 | Youssef Ben AbdAllah Ben Ali Bameqdam | 28.13 | 39.53 |
| | | | | Financial Holdings International | 0.00 | 119.07 | Fahmy Assmat Abdel Magied | 33.33 | 16.49 |
| | | | | Shaeirk for Insurance | 28.69 | 24.35 | Yassraia Abdel Aziz Ragab Hosni | 33.33 | 16.49 |
| | | | | CIB | 0.00 | 11.99 | Soleiman Abu Numay | 21.43 | 11.81 |
| | Total: 1 Foreign VC | 10.91 | 100.80 | Total: 12 Domestic VC | 17.01 | 384.62 | Total: 13 Business Angels | 24.10 | 45.73 |
| Morocco | Pan-African Inv. Partners [US] | 100.00 | 58.39 | Mamda/MCMA | 9.27 | 51.20 | Noraddine El Ayoubi | 35.00 | 45.05 |
| | Maghreb Pvt Equity Fund [Tunisia] | 36.01 | 7.70 | Al Qudrah | 9.06 | 34.17 | Chraibi Abdelmajid | 0.00 | 5.59 |
| | AfricInvest Ltd [Tunisia] | 35.83 | 3.33 | Fonds Capmezzanine | 50.38 | 17.86 | Héritiers Omar Laraqui | 23.50 | 4.04 |
| | | | | CIMR | 9.09 | 17.03 | Tahiri Abdelhak | 17.44 | 3.61 |
| | | | | SCR | 9.09 | 17.03 | Kenza Kabbaj | 25.00 | 2.77 |
| | | | | SMCD | 9.09 | 17.03 | Chakib Ben El Khadir | 21.76 | 2.44 |
| | | | | SOMED | 9.09 | 17.03 | Aicha Maarouf | 30.71 | 1.15 |
| | | | | Société Wafa Assurance | 9.09 | 17.03 | Alexandre Delieuze | 30.95 | 1.04 |
| | | | | CNCA | 0.00 | 14.01 | Héritiers El Ouarzazi | 36.36 | 0.97 |
| | | | | CDG (incl. Fipar Holding) | 0.00 | 13.99 | Abdelhakim El Youssfi | 44.74 | 0.42 |
| | Total: 3 Foreign VC | 48.77 | 16.96 | Total: 24 Domestic VC | 21.55 | 11.88 | Total: 11 Business Angels | 28.38 | 6.13 |

Table 3 continued

| Country | Foreign VC | Divest | Mean Equity stake | Domestic VC | Divest | Mean Equity stake | Business Angels | Divest | Mean Equity stake |
|---|---|---|---|---|---|---|---|---|---|
| | Name [Country of origin] | % | US$m | Name | % | US$m | Name | % | US$m |
| **Tunisia** | IFC [US] | 0.00 | 8.28 | Société Bentec | 30.00 | 7.37 | Jomaa Ben Sandrine | 15.38 | 5.52 |
| | United Gulf Bank [UAE] | 30.31 | 3.70 | Al-Mal Investment Co. | 30.30 | 2.31 | Rekik Mohamed | 29.99 | 4.93 |
| | Societe Abdulazziz [SA] | 16.02 | 1.57 | STB Sicar | 19.26 | 1.21 | Bouali Fatma | 0.00 | 1.83 |
| | Global Investment House [UAE] | 0.00 | 1.32 | SIM Sicar | 0.00 | 1.79 | Faycal Achour | 100.00 | 1.66 |
| | Soc. Amine Jamil Aldalaoui [SA] | 16.00 | 1.26 | Union de Placement et de Conseil en Assurances et Reassurances | 20.00 | 1.44 | Al Khouri Abdallah Abbes Ismail | 0.00 | 1.28 |
| | Industrie Ceramiche di Faenza [Italy] | 0.00 | 1.15 | Sicar Invest | 0.00 | 1.43 | Talal Mohamed Abbas | 0.00 | 1.28 |
| | Groupe Commercial Baroum [SA] | 16.00 | 0.74 | Challenge Sicar | 15.96 | 1.34 | Abdelhaq Farza | 74.18 | 0.84 |
| | | | | CIF Sicav | 81.38 | 1.30 | Chalhoub Ben Saleh Alchalhoub | 16.06 | 0.39 |
| | | | | ATD Sicar | 42.40 | 1.29 | Ali Ben Soliman Alchahry | 15.99 | 0.39 |
| | | | | Société El Bouniane | 25.00 | 1.15 | Abdullah Alrached Abou Niene | 15.99 | 0.39 |
| | Total: 7 Foreign VC | 11.19 | 2.58 | Total: 22 Domestic VC | 22.14 | 1.27 | Total: 13 Business Angels | 26.62 | 1.50 |

Source: Compiled by author from IPO listings prospectuses lodged with national regulators as well as individual firms

Notes: (1) Classifications of Foreign VC, Domestic VC and Business Angels are derived from descriptions within IPO listings prospectuses

(2) SA denotes Saudi Arabia; UAE denotes United Arab Emirates; US denotes United States

Table 4. OLS regression analysis of board and lead manager characteristics on IPO Firm underpricing

Table outlining results of determinants of IPO underpricing at 1 week following listing date. BA, Domestic VC and Foreign VC are all dummy variables taking value 1 if these entities have equity holdings in focal IPO firm and 0 otherwise. Lead Manager reputation is a market power variable constructed in the spirit of Megginson and Weiss (1991) in terms of relative market share of each broker with a particular market on basis of both gross proceeds raised by focal IPO firms that they have been involved in listing process and frequency of involvement in IPOs. Lead Manager Foreign is a dummy taking value 1 if lead manager is foreign and 0 otherwise. Log Tangible Assets is the natural logarithm of tangible assets, obtained from balance sheets of IPO listing prospectus and denominated in thousands of US$. Log Firm Age + 1 is the natural logarithm of firm age at time of listings, defined as number of years from establishment to year of listing. Log Revenue is the natural logarithm of firm gross (pre-tax and expenses) revenues in pre-IPO year, denominated in thousands of US$. Debt to Equity ratio is the ratio of debt and liabilities to shareholder equity in firm. Shares Offered/ Total Shares is ratio of shares offered at IPO to total number of issued and outstanding shares post-IPO. Institutional quality is aggregate and is as defined in Table 2. Finally privatization, foreign partner and Onwer = Lead Manager are dummy variables taking value 1 if IPO is a privatization of a former state-owned enterprise, has a long-term foreign partner (more commonly associated with joint ventures and subsidiaries of foreign firms) and finally if ultimate owner of firm is the same entity as the ultimate owner of lead manager. This last variable takes account of highly networked character of Maghreb economy with extensive business groups, routinely based on families, permeating state and private sector environments.

| Independent Variables | IPO Underpricing at 1 week | | | | | | |
| | Controls Model 1 | BA Model 2 | Domestic VC Model 3 | Foreign VC Model 4 | Lead Mgr. Rep. Model 5 | Lead Mgr. Foreign Model 6 | Grand Regression Model 7 |
|---|---|---|---|---|---|---|---|
| Intercept | 1.855 [2.62] †† | 1.851 [2.62] †† | 1.783 [2.63] †† | 1.921 [2.85] †† | 2.029 [2.50] † | 1.721 [2.36] † | 1.956 [2.65] †† |
| **Hypotheses** | | | | | | | |
| H-1.1 BA | | 0.008 [0.10] | | | | | 0.018 [0.24] |
| H-1.2 Domestic VC | | | **0.122 [2.29]\*\*** | | | | **0.113 [1.79]\*\*** |
| H-1.3 Foreign VC | | | | **-0.152 [-2.32] †** | | | **-0.220 [-2.98] ††** |
| H-2.1 Lead Mgr. Reputation | | | | | **0.507 [2.20]\*\*** | | **0.577 [2.83] ††** |
| H-2.2 Lead Mgr. Foreign | | | | | | **-0.142 [-2.88] ††** | **-0.078 [-1.58]\*** |
| **Firm Controls** | | | | | | | |
| Log (Tangible Assets) | 0.100 [2.10]** | 0.101 [2.11]** | 0.087 [1.82]** | 0.106 [2.15]** | 0.056 [1.28]* | 0.123 [2.80] †† | 0.060 [1.47]* |
| Log (Firm Age) + 1 | -0.021 [-0.43] | -0.021 [-0.43] | -0.011 [-0.27] | -0.019 [-0.41] | -0.008 [-0.16] | -0.025 [-0.56] | 0.004 [0.10] |
| Log (Revenue) | -0.065 [-0.94] | -0.065 [-0.93] | -0.049 [-0.77] | -0.063 [-0.95] | -0.050 [-0.67] | -0.088 [-1.28]* | -0.045 [-0.72] |
| Debt to Equity Ratio | -0.014 [-2.08]** | -0.014 [-2.13]** | -0.015 [-2.37] † | -0.014 [-2.13]** | -0.015 [-2.04]** | -0.012 [-1.88]** | -0.014 [-2.63] †† |
| **IPO and Ownership Controls** | | | | | | | |
| Shares Offered/ Total Shares | -0.412 [-1.28]* | -0.416 [-1.28]* | -0.403 [-1.28]* | -0.456 [-1.48]* | -0.476 [-1.39]* | -0.421 [-1.15] | -0.537 [-1.62]* |
| Institutional Quality | -3.548 [-2.86] †† | -3.543 [-2.82] †† | -3.580 [-2.88] †† | -3.723 [-3.17] †† | -3.912 [-2.73] †† | -3.152 [-2.74] †† | -3.929 [-3.11] †† |
| Privatization | -0.115 [-1.28]* | -0.114 [-1.29]* | -0.116 [-1.04] | -0.134 [-1.33]* | -0.199 [-2.97] †† | -0.076 [-0.71] | -0.210 [-3.58] †† |
| Foreign Partner | 0.005 [0.05] | 0.005 [0.04] | 0.023 [0.22] | 0.009 [0.07] | 0.081 [0.82] | 0.005 [0.04] | 0.113 [1.42]* |
| Owner = Lead Mgr. | 0.178 [3.91] †† | 0.178 [3.92] †† | 0.160 [3.28] †† | 0.148 [2.84] †† | 0.173 [3.59] †† | 0.176 [3.76] †† | 0.107 [2.23]** |
| | | | | | | | |
| Country Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 82 | 82 | 82 | 82 | 79 | 82 | 79 |
| F-statistic (probability) | 2.85 [0.00] | 2.67 [0.00] | 3.11 [0.00] | 2.90 [0.00] | 3.36 [0.00] | 3.11 [0.00] | 3.95 [0.00] |
| Adjusted $R^2$ | 0.3027 | 0.2914 | 0.3428 | 0.3195 | 0.3772 | 0.3426 | 0.4754 |
| Change in $R^2$ over controls | | -0.0113 | **0.0401** | **0.0168** | **0.0745** | **0.0399** | **0.1727** |

Notes: (1) *p<0.10; **p<0.05; †p<0.01; ††p<0.005. T-statistics are in parentheses; (2) White cross-section standard errors & covariance (d.f. corrected)

Table 5. OLS regression analysis of institutional determinants on IPO Firm underpricing

This table reports the results of IPO underpricing related to firm and market characteristics in addition to the six World Bank Governance institutional quality measures, namely corruption control, effective government, political stability, regulatory quality, rule of law and voice and accountability. All variables are as defined in Table 4.

| Independent Variables | IPO Underpricing at 1 week | | | | | | |
| | Controls only | Corruption Control | Effective Government | Political Stability | Regulatory Quality | Rule of Law | Voice & Accountability |
| | Model 8 | Model 9 | Model 10 | Model 11 | Model 12 | Model 13 | Model 14 |
|---|---|---|---|---|---|---|---|
| Intercept | 0.090 [0.19] | 1.118 [2.01]** | 0.861 [1.25] | 0.622 [1.11] | 0.489 [0.64] | 0.711 [1.14] | -0.040 [-0.09] |
| **Hypotheses** | | | | | | | |
| H-3.1 Corruption Control | | **-2.894 [-3.76] ††** | | | | | |
| H-3.2 Effective Government | | | **-1.571 [-1.83]**** | | | | |
| H-3.3 Political Stability | | | | **-1.061 [-2.05]**** | | | |
| H-3.4 Regulatory Quality | | | | | -0.911 [-0.90] | | |
| H-3.5 Rule of Law | | | | | | **-1.333 [-1.68]**** | |
| H-3.6 Voice & Accountability | | | | | | | 0.289 [0.59] |
| **Market factors** | | | | | | | |
| BA | 0.012 [0.15] | 0.004 [0.06] | 0.024 [0.30] | 0.010 [0.13] | 0.011 [0.13] | 0.013 [0.16] | 0.011 [0.13] |
| Domestic VC | 0.103 [1.60]* | 0.106 [1.68]** | 0.099 [1.61]* | 0.104 [1.71]** | 0.105 [1.68]** | 0.098 [1.54]** | 0.096 [1.47]* |
| Foreign VC | -0.191 [-2.14]** | -0.181 [-2.33] † | -0.214 [-2.57] †† | -0.232 [-2.48] † | -0.172 [-1.97]** | -0.239 [-2.44] † | -0.199 [-2.04]** |
| Lead Mgr. Reputation | 0.525 [2.34] † | 0.605 [2.87] †† | 0.629 [2.96] †† | 0.556 [2.68] †† | 0.501 [2.17]** | 0.534 [2.33] † | 0.520 [2.28]** |
| Lead Mgr. Foreign | -0.088 [-1.68]* | -0.062 [-1.28]* | -0.078 [-1.44]* | -0.084 [-1.54]* | -0.090 [-1.71]** | -0.070 [-1.28]* | -0.091 [-1.70]** |
| **Firm Controls** | | | | | | | |
| Log (Tangible Assets) | 0.055 [1.28]* | 0.041 [0.91] | 0.042 [0.94] | 0.068 [1.56]* | 0.072 [1.48]* | 0.066 [1.48]* | 0.063 [1.33]* |
| Log (Firm Age) + 1 | -2.99E-04 [-0.01] | -0.014 [-0.37] | -0.005 [-0.12] | -0.001 [-0.04] | 0.003 [0.08] | 1.99E-05 [0.004] | -0.003 [-0.08] |
| Log (Revenue) | -0.052 [-0.69] | -0.021 [-0.30] | -0.039 [-0.59] | -0.041 [-0.58] | -0.060 [-0.76] | -0.045 [-0.61] | -0.052 [-0.70] |
| Debt to Equity Ratio | -0.014 [-2.32] † | -0.018 [-2.87] †† | -0.019 [-2.88] †† | -0.017 [-2.70] †† | -0.014 [-2.47] † | -0.016 [-2.57] †† | -0.016 [-2.42] † |
| **IPO and Ownership Controls** | | | | | | | |
| Shares Offered/ Total Shares | -0.479 [-1.28]* | -0.569 [-1.52]* | -0.527 [-1.47]* | -0.482 [-1.33]* | -0.452 [-1.28]* | -0.430 [-1.15] | -0.466 [-1.28]* |
| Privatization | -0.108 [-1.37]* | -0.111 [-1.59]* | -0.135 [-1.98]** | -0.168 [-2.83] †† | -0.128 [-1.77]** | -0.140 [-1.77]** | -0.104 [-1.28]* |
| Foreign Partner | 0.155 [1.92]** | 0.103 [1.49]* | 0.150 [1.72]** | 0.126 [1.57]* | 0.131 [1.49]* | 0.139 [1.68]** | 0.146 [1.73]** |
| Owner = Lead Mgr. | 0.129 [2.09]** | 0.097 [1.88]** | 0.115 [1.92]** | 0.125 [2.33] † | 0.146 [2.21]** | 0.117 [2.01]** | 0.133 [2.05]** |
| Country Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 79 | 79 | 79 | 79 | 79 | 79 | 79 |
| F-statistic (probability) | 3.19 [0.00] | 3.99 [0.00] | 3.46 [0.00] | 3.43 [0.00] | 3.10 [0.00] | 3.21 [0.00] | 3.05 [0.00] |
| Adjusted R$^2$ | 0.4026 | 0.4896 | 0.4409 | 0.4376 | 0.4021 | 0.4142 | 0.3970 |
| Change in R$^2$ over controls | | **0.0870** | **0.0383** | **0.0350** | -0.0005 | **0.0116** | -0.0056 |

Notes: (1) *$p<0.10$; **$p<0.05$; †$p<0.01$; ††$p<0.005$. T-statistics are in parentheses
(2) White cross-section standard errors & covariance (d.f. corrected)

Table 6. The effects of business angel and private equity ownership on IPO firm underpricing
This table presents results from Two Stage Least Squares (2SLS) models studying impact on IPO underpricing of retained BA, Domestic and Foreign VC ownership respectively. IPO underpricing is estimated at 1 week following listing. BA/ VC/ VC Foreign and VC Domestic ownership is percentage retained ownership by business angels, foreign venture capital and domestic venture capital post-IPO. All independent variables are defined in Table 4. Four additional instruments are used alongside exogenous independent variables. These being ratio of independent nonexecutives to board size, natural logarithm of number of employees alongside dummy (0/1) variables indicating whether the firm is part of a business group, is a family controlled firm and then whether Business Angels, Foreign VC and Domestic VC are part of an investment consortium.

| Independent Variables | IPO Underpricing at 1 week | | |
|---|---|---|---|
| | BA Own (%) Model 15 | VC Foreign Own (%) Model 16 | VC Domestic Own (%) Model 17 |
| Intercept | 2.033 [2.67] †† | 1.907 [2.68] †† | 1.602 [2.47] † |
| **Hypotheses** | | | |
| H-4.1 BA own post-IPO (%) | **-0.022 [-1.98]**** | | |
| H-4.2 VC Foreign own post-IPO (%) | | **-0.004 [-1.28]*** | |
| H-4.3 VC Domestic own post-IPO (%) | | | **0.009 [2.15]**** |
| **Firm Controls** | | | |
| Log (Tangible Assets) | 0.082 [1.68]** | 0.097 [2.04]** | 0.087 [1.77]** |
| Log (Firm Age) + 1 | -0.009 [-0.18] | -0.016 [-0.34] | -0.018 [-0.41] |
| Log (Revenue) | -0.053 [-0.77] | -0.063 [-0.94] | -0.040 [-0.65] |
| Debt to Equity Ratio | -0.015 [-2.16]** | -0.014 [-2.06]** | -0.015 [-2.34] † |
| **IPO and Ownership Controls** | | | |
| Shares Offered/ Total Shares | -0.314 [-0.96] | -0.406 [-1.28]* | -0.541 [-1.48]* |
| Institutional Quality | -3.931 [-2.93] †† | -3.681 [-2.99] †† | -3.130 [-2.61] †† |
| Privatization | -0.147 [-1.50]* | -0.118 [-1.28]* | -0.120 [-0.97] |
| Foreign Partner | 0.042 [0.31] | 0.019 [0.16] | 0.009 [0.08] |
| Owner = Lead Mgr. | 0.184 [3.45] †† | 0.169 [3.54] †† | 0.121 [1.68]** |
| Country Effects | Yes | Yes | Yes |
| Industry Effects | Yes | Yes | Yes |
| Observations | 82 | 82 | 82 |
| F-statistic (probability) | 3.34 [0.00] | 2.71 [0.00] | 3.13 [0.00] |
| Adjusted R2 | 0.2525 | 0.3044 | 0.3243 |

Notes:   (1) *p<0.10; **p<0.05; †p<0.01; ††p<0.005. T-statistics are in parentheses
        (2) White cross-section standard errors & covariance (d.f. corrected)

**Appendix Table 1. IPO Subscription statistics**

| Company | Date of IPO | Type | No. Shares Offered | No. Shares Subscribed | Funds Raised (US$m) | Rate of Subscribe |
|---|---|---|---|---|---|---|
| **Panel 1: Morocco (2000 – 2012)** | | | | | | |
| Managem | 11/07/2000 | IPO | 2,126,930 | 19,888,109 | 106.68 | 935.06% |
| Unimer | 29/03/2001 | IPO | 110,000 | 916,526 | 6.63 | 833.21% |
| IB Maroc.com | 10/07/2001 | IPO* | 83,500 | 139,802 | 4.40 | 167.43% |
| BCP | 06/07/2004 | IPO | 1,177,610 | 10,254,573 | 86.27 | 870.80% |
| Itissalat Al Maghreb | 13/12/2004 | IPO | 130,985,210 | 2,816,268,721 | 963.08 | 2,150.07% |
| Sothema | 21/02/2005 | IPO | 150,000 | 1,087,994 | 10.92 | 725.33% |
| Dari Couspate | 11/07/2005 | IPO* | 80,000 | 869,807 | 3.16 | 1,087.26% |
| Lydec | 18/07/2005 | IPO | 1,120,000 | 27,511,475 | 28.79 | 2,456.38% |
| Risma | 15/05/2006 | Rights | 1,041,066 | 25,487,128 | 28.56 | 2,448.18% |
| Mediaco Maroc | 12/06/2006 | Rights | 35,000 | 514,429 | 1.98 | 1,469.80% |
| Cartier Saada | 21/06/2006 | Rights | 120,000 | 2,031,846 | 2.54 | 1,693.21% |
| Douja Prom Addoha | 06/07/2006 | IPO | 4,725,000 | 82,556,234 | 315.97 | 1,747.22% |
| Distrisoft Maroc | 26/09/2006 | IPO | 76,387 | 3,686,941 | 5.20 | 4,826.66% |
| Distrisoft Maroc | 26/09/2006 | Rights | 33,613 | 3,686,941 | 2.29 | 10,968.79% |
| Colorado | 27/10/2006 | IPO | 270,000 | 10,082,592 | 15.86 | 3,734.29% |
| Fenie Brosette | 04/12/2006 | Rights | 338,984 | 13,976,494 | 11.43 | 4,123.05% |
| Societe de Realisations Mecaniques | 12/12/2006 | Rights | 70,000 | 1,243,562 | 3.12 | 1,776.52% |
| Involys | 14/12/2006 | IPO* | 166,000 | 3,620,248 | 6.00 | 2,180.87% |
| Hightech Payment Systems | 27/12/2006 | IPO | 195,000 | 5,744,774 | 18.95 | 2,946.04% |
| Matel PC Market | 28/02/2007 | IPO | 374,594 | -- -- | 17.26 | -- -- |
| Promopharm | 15/06/2007 | IPO | 270,045 | -- -- | 29.60 | -- -- |
| M2M | 04/07/2007 | IPO | 129,555 | -- -- | 17.67 | -- -- |
| Timar | 17/07/2007 | IPO | 45,000 | -- -- | 1.96 | -- -- |
| Compagnie Generale Immobiliere | 10/08/2007 | IPO | 3,681,600 | -- -- | 436.57 | -- -- |
| Atlanta | 16/10/2007 | IPO | 1,005,720 | -- -- | 150.33 | -- -- |
| Societe Nationale d'Electrolyse et de Petrochimie | 07/11/2007 | IPO | 840,000 | -- -- | 130.79 | -- -- |
| Stokvis Afrique Nord | 03/12/2007 | IPO | 183,903 | -- -- | 13.52 | -- -- |
| Salafin | 17/12/2007 | IPO | 447,761 | -- -- | 37.37 | -- -- |
| Microdata | 31/12/2007 | IPO | 126,000 | -- -- | 15.07 | -- -- |
| Delatttre Levivier Maroc | 29/04/2008 | IPO | 125,000 | 790,000 | 10.99 | 632.00% |
| Delta Holdings | 15/05/2008 | IPO | 1,020,000 | 2,2440,000 | 113.15 | 2,200.00% |
| Compagnie Miniere de Touissit | 04/06/2008 | IPO | 490,040 | 7,061,477 | 36.22 | 1,441.00% |
| Label Vie | 02/07/2008 | IPO | 458,150 | 2,290,750 | 63.20 | 500.00% |
| Alliances Developpment Immobiliere | 17/07/2008 | IPO | 2,915,000 | 84535000 | 240.77 | 2,900.00% |
| Ennakl Automobiles | 13/07/2010 | IPO | 3,000,000 | 23 690 732 | 185.19 | 790.00% |
| CNIA Saada | 22/11/2010 | IPO | 617,531 | 8272351 | 1,051.21 | 1,340.00% |
| Stroc Industrie | 30/06/2011 | IPO | 288,515 | 2,515,369 | 105.84 | 872.00% |
| Jet Alu | 09/12/2011 | IPO | 816,667 | 1,637,311 | 55.58 | 200.00% |
| S2M | 27/12/2011 | IPO | 240,000 | 372,640 | 14.27 | 155.00% |
| Afric Industries | 05/01/2012 | IPO | 110,770 | 634,368 | 17.78 | 572.00% |
| **Mean (Morocco):** | | | **4,002,254** | **108,969,568** | **109.15** | **1,958.07%** |

Source: Bourse de Casablanca website annual reports
Notes: (1) * indicates IPO + Rights; (2) Years omitted indicate no IPOs for that year

| Company | Date of IPO | Type | No. Shares Offered | No. Shares Subscribed | Funds Raised (US$m) | Rate of Subscribe |
|---|---|---|---|---|---|---|
| **Panel 2: Tunisia (2005 – 2012)** | | | | | | |
| Société GIF-Filter | 01/02/2005 | IPO | 333,300 | 616,605 | 3.71 | 185.00% |
| Société ASSAD | 01/03/2005 | IPO* | 480,000 | 480,000 | 6.69 | 100.00% |
| Société Karthago Airlines | 01/08/2005 | IPO | 2,000,000 | 9,780,000 | 7.12 | 489.00% |
| Société Immobilière Tuniso Saoudienne | 2006 | IPO | 540,000 | 1,900,800 | 4.42 | 352.00% |
| Société Essoukna | 2006 | IPO* | 1,359,375 | 2,623,594 | 4.75 | 193.00% |
| El Wifack Leasing | 2006 | IPO | 600,000 | 1,122,000 | 2.50 | 187.00% |
| Société Adwya | 2007 | IPO | 3,000,320 | 12,061,286 | 6.03 | 402.00% |
| Société Tunisie Profilés Aluminium | 2007 | IPO* | 4,800,000 | 26,736,000 | 15.88 | 557.00% |
| Société de Production Agricole Teboulba | 2007 | IPO | 522,742 | 538,424 | 4.53 | 103.00% |
| Poulina Group Holding | 19/08/2008 | IPO | 7,325,530 | 137,216,472 | 33.68 | 823.00% |
| | | Placement** | 9,344,470 | -- -- | -- -- | -- -- |
| Société Automobile Réseaux Tunisien et Services | 07/04/2008 | IPO | 4,125,900 | 48,783,694 | 32.93 | 634.00% |
| | | Placement** | 3,570,000 | -- -- | -- -- | -- -- |
| | | Placement*** | 2,402,100 | -- -- | -- -- | -- -- |
| Servicom | 01/06/2009 | IPO | 1,000,000 | 1,397,307 | 2.48 | 140.00% |
| Les Ciments de Bizerte | 08/10/2009 | IPO | 8,809,460 | 8,848,898 | 77.17 | 100.00% |
| Assurances Salim | 19/03/2010 | IPO | 660,000 | 17,987,879 | 6.95 | 2,725.00% |
| Tunis Re | 26/04/2010 | IPO | 2,000,000 | 61,286,838 | 9.83 | 3,064.00% |
| Carthage Cement | 10/06/2010 | IPO | 20,337,846 | 319,853,829 | 27.14 | 472.00% |
| | | Placement** | 47,368,421 | -- -- | -- -- | -- -- |
| | | Placement*** | 3,293,733 | -- -- | -- -- | -- -- |
| Ennakl Automobiles | 12/07/2010 | IPO | 4,600,000 | 101,088,600 | 34.57 | 2,198.00% |
| | | Placement** | 4,400,000 | -- -- | -- -- | -- -- |
| Modern Leasing | 01/12/2010 | IPO | 1,000,000 | 21,497,692 | 5.97 | 2,150.00% |
| Telnet Holding | 17/05/2011 | IPO | 2,070,000 | 6,667,570 | | 322.00% |
| **Mean (Tunisia):** | | | 3,450,762 | 41,078,289 | 20.84 | 799.79% |
| **Mean (Kenya – 2000 to 2006)** | | | 153,858,589 | | | 280.25% |

Source: Tunisia: Bourse de Tunis website annual reports; Kenya: Suntra Investment Bank, Nairobi

Notes: (1) Kenya is used as a comparably sized English common law jurisdiction developing market for reference and comparability (2) * indicates IPO + Rights; **Guaranteed Placement, ***Private Placement